

Advance Optics and Biophysics Applications

Optical Science and Engineering (OPSE 410) Spring 2023

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Office hours: Thursday 11:30 am to 1:00 pm or request appointment by email.

Synopsis of this course: A quantitative view of selected optical concepts of biophysics and optical instruments used for medical applications. The course will give you a chance to learn about the use of optics in biology related fields. The course is organized as a series of lectures and lab work. Extinction, optical absorption spectroscopy, differential optical absorption spectroscopy and other optical methodologies will be used to probe material related to biology.

Text (optional):

- “Physics in Biology and Medicine,” Paul Davidovits (3rd Edition, paperback and e-book, ISBN-13: **978-0123694119**).
- “Quantitative Biomedical Optics: Theory, Methods, and Applications” Irving J. Bigio, Sergio Fantini (Cambridge Texts in Biomedical Engineering) 1st Edition

Assessment Plan:

Final grade on the basis of the following assignments and weighting:

Lab. reports / Homework*	30 %
Quiz, oral participation	10 %
Oral presentation	10 %
Common exam	20 %
Final exam	30 %

**Report / homework will have a -5% penalty per day if submitted past their deadline and will not be accepted at all after the date of the final exam.*

Translate % values into letter grades with the standard physics department scale as follows:

F: <40; D: 40-50; C: 50-60; C+: 60-69; B: 69-75; B+: 75-82; A: >82

F: <40; D: 40-48; C: 48-57; C+: 57-65; B: 65-70; B+: 70-78; A: >78

Outcomes plan: Students will learn about:

1. the basics of optics and interactions between light and biological matter
2. How common optical instruments used in the medical field work
3. Optical methodologies to probe and study tissues

Academic integrity and honesty are important to both students and professors. The NJIT Student Council and the faculty strongly support fairness for all students. To help ensure this equity the NJIT Administration requires that every professor bring cheating to the attention of the Dean of Students.